ABSTRACT OF THE DISCLOSURE

A vehicle occupant detection/classification and posture estimation system includes a camera equipped with a wide-angle ("fish eye") lens and mounted in the vehicle headliner captures images of all vehicle seating areas. Image processing algorithms can be applied to the image to account for lighting, motion, and other phenomena. A spatial-feature vector is then generated which numerically describes the visual content of each seating area. This descriptor is the result of a number of digital filters being run against a set of sub-images, derived from pre-defined window regions in the original image. This spatial-feature vector is used as an input to an expert classifier function, which classifies each seating area as best representing a scenario in which the seat is (i) empty, (ii) occupied by an adult, (iii) occupied by a child, (iv) occupied by a rear-facing infant seat (RFIS), (v) occupied by a front-facing infant seat (FFIS), or (vi) occupied by an undetermined object. Seating areas which are determined to be occupied by an adult are further sub-classified as (i) occupant in position, or (ii) occupant out-of-position. Out-of-position occupants are occupants who are determined to be within the "keep out zone" of the airbag.